

Title (en)
CRYOGENIC LIQUEFYING REFRIGERATING METHOD AND DEVICE

Title (de)
TIEFTEMPERATURVERFLÜSSIGUNGSKÜHLVERFAHREN UND -VORRICHTUNG

Title (fr)
PROCEDE ET DISPOSITIF DE REFRIGERATION ET LIQUEFACTION CRYOGENIQUES

Publication
EP 1813889 B1 20160622 (EN)

Application
EP 05719451 A 20050224

Priority
• JP 2005003001 W 20050224
• JP 2004330160 A 20041115

Abstract (en)
[origin: EP1813889A1] Cryogenic liquefying/refrigerating method and system, wherein temperature of gas-to-be-liquefied at the inlet of the compressor for compressing the gas is reduced by cooling the gas discharged from the compressor using a high-efficiency chemical refrigerating machine and vapor compression refrigerating machine before the gas is introduced to a multiple stage heat exchanger thereby reducing power input to the compressor and improving liquefying/refrigerating efficiency. Gas-to-be-liquefied compressed by a compressor (33) is cooled by aftercooler (37), and further cooled by an adsorption refrigerating machine (38) which utilizes waste heat generated in the compressor and by an ammonia refrigerating machine 40, then the high pressure gas is introduced to a multiple-stage heat exchanger (22-26) where it is cooled by low pressure low temperature gas separated from a mixture of liquid and gas generated by adiabatically expanding the high pressure gas through an expansion valve 30 and returning to the compressor, and a portion of the high pressure gas is expanded adiabatically by expansion turbines (28, 29) in mid-course of flowing of the high pressure gas through the stages of the heat exchanger to be joined with the low pressure low temperature gas returning to the compressor.

IPC 8 full level
F25B 25/00 (2006.01); **F25B 9/00** (2006.01)

CPC (source: EP KR US)
F25B 9/00 (2013.01 - KR); **F25B 9/06** (2013.01 - EP US); **F25B 25/00** (2013.01 - EP KR US); **F25J 1/0007** (2013.01 - EP US); **F25J 1/0025** (2013.01 - EP US); **F25J 1/0037** (2013.01 - EP US); **F25J 1/004** (2013.01 - EP US); **F25J 1/0045** (2013.01 - EP US); **F25J 1/005** (2013.01 - EP); **F25J 1/0052** (2013.01 - EP); **F25J 1/0065** (2013.01 - EP); **F25J 1/0202** (2013.01 - EP); **F25J 1/0208** (2013.01 - EP US); **F25J 1/0227** (2013.01 - EP US); **F25J 1/0242** (2013.01 - EP US); **F25J 1/0276** (2013.01 - EP US); **F25J 1/0292** (2013.01 - EP); **F25J 1/0297** (2013.01 - EP US); **F25J 2220/62** (2013.01 - EP US); **F25J 2230/08** (2013.01 - EP US); **F25J 2230/30** (2013.01 - EP); **F25J 2230/60** (2013.01 - US); **F25J 2240/40** (2013.01 - EP); **F25J 2270/06** (2013.01 - EP US); **F25J 2270/906** (2013.01 - EP US); **F25J 2270/912** (2013.01 - EP US)

Cited by
FR2954973A1; CN108489133A; GB2504765A; EP2746707A1; CN105008834A; WO2021214225A1; WO2009057179A3; WO2014095877A1

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)
EP 1813889 A1 20070801; **EP 1813889 A4 20110803**; **EP 1813889 B1 20160622**; CA 2586775 A1 20060518; CN 100510574 C 20090708; CN 101099068 A 20080102; ES 2582941 T3 20160916; JP 4521833 B2 20100811; JP WO2006051622 A1 20080807; KR 101099079 B1 20111226; KR 20070088631 A 20070829; NO 20072837 L 20070803; RU 2007122345 A 20081220; RU 2362099 C2 20090720; US 2007251266 A1 20071101; US 7540171 B2 20090602; WO 2006051622 A1 20060518

DOCDB simple family (application)
EP 05719451 A 20050224; CA 2586775 A 20050224; CN 200580046246 A 20050224; ES 05719451 T 20050224; JP 2005003001 W 20050224; JP 2006544772 A 20050224; KR 20077010990 A 20050224; NO 20072837 A 20070604; RU 2007122345 A 20050224; US 74872907 A 20070515